STAT

PROGRESS REPORT

For

VERSATILE, HIGH PRECISION STEREO POINT TRANSFER DEVICE

Period Covered:	January 1965
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OBJECTIVE ASSEMBLY

Several conclusions have been made with regard to improvement of image brightness, light distribution and distortion. Brightness increase that will be seen in all magnification ranges, especially the highest range was implemented by design changes in light source. By the addition of a field lens at the 1X objective lens to supplement the existing fixed field lens a noticeable brightness improvement was observed at field edge. Bending lower field lens under .38X objective lens image distortion was greatly improved. All above changes are in work and required making several special lenses and manufacture of new mounts.

Laser evaluation has again been delayed because of development work on vacuum holddown. However, checkout of reticle controls is nearly complete. The control power supply with improved regulation is working well with its associated circuitry.

VACUUM FILM HOLDDOWN

Much work has been expended in this area to discover a method to reduce or eliminate air bubbles under film when using 9½" wide film, improve visibility of film edges and to reduce drag on film during transport. Manifold design was changed so that film edges ride in 3/16" deep slots in clear plastic

manifolds. The air under film is evacuated by shallow slots on underside of manifold below film guiding slots running right angles to film edge. Although this scheme improves film drag during transport and visibility to film edge, air bubbles still persist. Numerous methods for controlling air pressure have been tried with little reduction in bubble size. Generally, about 90% or better of scanned area is pulled down within a few seconds and complete pull-down can get to a minute or more. Perhaps the interim for complete pulldown can be used for preliminary film scanning. To get any reduction in pulldown time with 9½" film some configuration with microgrooves will have to be considered together with some effect on image. To minimize image degradation, increased diffusion of input light will be required, but the small numerical aperture of 3 magnification ranges, the added light loss with the accompanying need to increase light source output and increase in film temperature, will make further refinements in high intensity light source necessary. Microgroove cross section and means to mask or minimize optical effects of cross section could have serious side effects on existing parts of the viewer.

We will approach several suppliers for availability of improved microgroove cross sections and patterns.

SCANNING DRIVE

Receipt of modified gear boxes will be delayed until March 1, 1965 because of internal problems at vendor. The long delivery required for a clutch concerned in the modification proved to have no delay. This fact will allow

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vendor shipment and installation of all gear boxes. Special switch for gear selection has also been received. The joystick is being thoroughly checked out for geometry and electrical error sources seen in alignment motions. The problem plaguing completion is failure to get a high degree of correspondence between channels at low joystick deflections. We have built several fixtures to aid evaluation here. In addition, a switch has been added to the joystick mechanism for improvement in synchronizing motion between axes. Except for the joystick deflections within a few degrees of null, the switch will be "ON" and, therefore, all axes will be in motion at once, or at least a much smaller interval of delay than with switches formerly used.

The two-speed stop scheme has been eliminated to speed up return from scanning limits. This motion also simplified the redesign and rewiring of gear selecting circuit. As the circuit now stands, carriages will halt and remain in gear selected by the operator at the scanning stop limits.

Work to be Completed During Next Reporting Period

1) Install and debug scanning drive modification
2) Fire up system. Advance into system debugging
3) Complete laser film marking evaluation
4) Complete redesign, fabrication and assembly of vacuum film holddown mechanism
5) Complete optical debugging

ILLEGIB

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